Manufacturer's declaration. Compliance with ENA EREC

(Engineering Recommendation) G100

Export Limitation Systems (ELS)

G100 Compliance Certificate

Manufacturer: VOLTACON UK LIMITED

Voltacon Energy Meter SDM630 with Modbus connection.

To implement export limitation in a Voltacon's systems (Hybrid, grid tie), an Energy Meter SDM630 with current transformers and with Modbus communication card is used

The meter has an integrated RS485 port hard wired to the following inverters: Voltasol Hybrid Inverter(s) 3kW, 5kW, 5.5kW and 10kW versions. UK DNO's require a fail-safe operation hard-wired between the components (Inverters, electricity meter and power controller) of the export limiter scheme and specific power quality.

REQUIREMENT: The scheme has hard wired communication links between the various components

The communication is made via Modbus RS485 output

REQUIREMENT: The export limitation scheme operates signals to the generation to reduce output within 1 second.

The Eastron SDM630 transmits measured values, one averaged value per second to the power controller. The power controller sends new set points to for the AC output power to the inverter. The MPP controller adjusts the power transfer from the panels to the inverter output. If the maximum allowed power has reached the MPP will reduce the production from the PV panels.

REQUIREMENT. The scheme is fail safe and limits export if the export limiter fails or loses its power supply

If the controller or the energy meter fails the export energy will remain to the agreed level or less.

REQUIREMENT: When the export limitation scheme operates, it will reduce the exported active power to a value equal to or less than, the agreed export capacity.

Power export peaks of typical load steps are limited by the export control circuit within 5 sec.

Note: In order to run 0-watt closed loop control with PV system, it is required to operate a base load (self-consumption) of at least 0.5% of the rated output power of the solar inverter.

The energy meter is the power measurement unit and the export limitation is solely calculated by the inverter and communication protocol and no other hardware. Any schematic will therefore not comprise of additional discrete units such as detailed in G100 (Load Control Unit, Interface Unit, Generator Interface Unit or Control Unit).

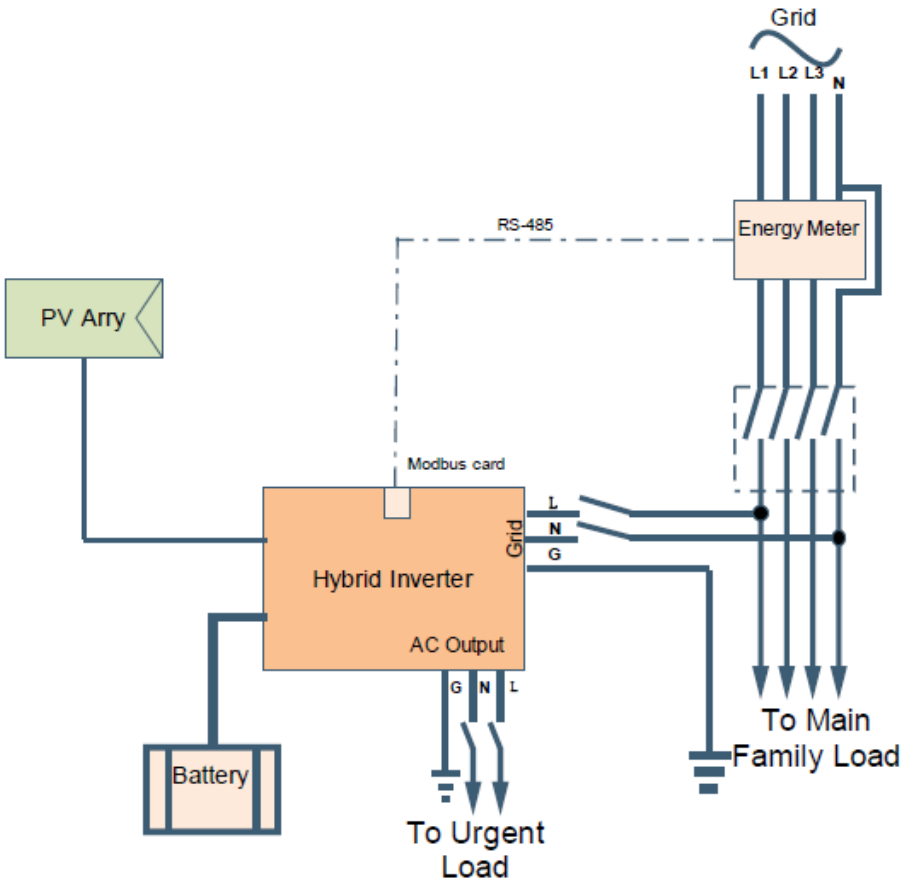
The solar inverter is adjusting the power from the solar panels by controlling the operating points so that the inverter does not generate energy it does not need from the solar PV panels.

The Voltacon system does not make use of resistive, inductive or any other type of load to dump excessive energy, including water heaters, therefore there are not additional harmonics due to the Export Limitation System functioning.

The inverter generated harmonics are stated in the respective G83/G59 certification.

The ELS may be programmed with a site export limit in kW and is set within a password protected menu to prevent system owner override. The limit can also be set to zero, upon which the inverters output relays will open circuit the inverter to give a true zero output.

There is also the option to set P(V) limits should the DNO specifically request this to prevent exported power above statutory voltage limits. The regulation states The ELS must detect an excursion and reduce the export to the Agreed Export Capacity or less within 5 seconds.



Failure Modes – the following detail describes why the SolarEdge ELS is a failsafe scheme

1. As the Energy meter is located at the grid connection point, a power failure would naturally isolate the PV system through standard G83/G59 methods.

2. If the Energy meter itself were to fail, the RS485 communications would be lost and the inverters would permanently reduce to the site export limit which has been set.

3. If the CG (if fitted) were to lose its power supply/fail then the inverters would permanently reduce to any export limit which has been set due to communications failure from the unit.

4. If the RS485 communication connections/cable is damaged, then the RS485 signal would be lost and the inverters would permanently reduce to the export limit which has been set.

5. If an individual inverter fails, then that inverter is bypassed due to a parallel connection and does not affect the operation of other components which would continue to limit the system to the export limit which has been set.

6. If the current transformer wiring is removed, or the signal is lost, the inverters would permanently reduce to the site export limit which has been set. Requires meter with PN SE-WND-3Y400-MB-K2 and inverter CPU version 3.225x or 3.24xx or above, and requires the installer to enable the CT loss feature.

Technology Director

Stefanos Kandilidis

Coventry, England

25th of March 2019